#### **Research Article**

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# Gender-Oriented Analysis of Witchcraft Discourse in Social Media

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**Abstract:** In this article, I delve into the studies of digital religion and female witchcraft, examining Polish witch stereotypes and tracing their evolution from a historical and religious perspective. I portray the harmful image of the persecuted witch within a misogynistic society and contrast it with the contemporary, positive stereotype of an independent, strong, and wise woman. A total of 724 study participants shared their opinions about witches, which were then subjected to sentiment analysis, revealing eight fundamental emotions along with their polarizations. Additionally, gender was juxtaposed with the SD-WISE scale measuring wisdom-related cognitive, reflective, and affective qualities in individuals, including emotional regulation, reflection, empathy, acceptance of diversity, and spirituality. The outcomes indicated that studied women experienced stronger and more positive emotions toward female witches and higher levels of wisdom-related traits typical of witch-related connotations. Male participants demonstrated greater emotional regulation and decisiveness. These findings bear significance for sociologists and researchers exploring gender studies, religion, culture, and the realm of witchcraft.

Keywords: digital religion, feminism, female witches, sentiment analysis, social media

#### 1 Introduction

In spite of the dedicated efforts put forth by female witches to establish a novel portrayal, they often find themselves subjected to external unfavorable judgments based on outdated stereotypes. Arguably the most widely recognized, the medieval concept of witches finds its origins intertwined with ancient Greek and Latin pagan writings. Although early Christian literature rarely alludes to female witches, the notion of malevolent witchcraft, characteristic of this faith, has undergone a significant evolution over the passage of time, particularly owing to the inclusion of the Pentateuchal religious law in Exodus 22:18: "Thou shalt not suffer a witch to live." These words have proven to be of such substantial influence that they persistently serve as a justification for the persecution of witches, even nowadays. Although the object of this sentence was in the feminine singular form in Hebrew, denoting a "feminine practitioner," the term "witch" was not inherently gender-specific until the fourteenth century. Since that era, the term "witch" has predominantly become associated with women and bears a predominantly negative connotation.

4 Martin, Conjuring Moments.

<sup>1</sup> Frenschkowski, "Witchcraft, Magic and Demonology."

<sup>2</sup> Adu-Gyamfi, "Thou Shalt not Suffer a Witch to Live."

<sup>3</sup> Ibid.

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A counterpoint to such a hostile, misogynistic concept of witches is the portrayal of the liberated contemporary female witch, who rises above societal preconceptions and challenges prevailing viewpoints that perpetuate oppressive social dynamics. Mindful of embracing her humanity in a world that frequently overlooks the innate worth of the human essence, she undertakes a transformative journey, surpassing established norms and affirming her essential right to shape both herself and the world. In the present day, being a witch symbolizes autonomy and a pathway to emancipation. A witch attunes herself to her feelings, emotions, visions, intuition, empathy, body, and possesses an independent mind. Being a witch serves as a label for individuals who challenge societal norms and do not conform to its inflexible standards, practicing magic is no longer a prerequisite. Such portrayal of a witch aligns with feminist principles and fosters a sense of fellowship among its global sisterhood by virtue of its essential attribute, femininity.

Furthermore, there remains the image of the witch, a creature possessing magical abilities stemming from fairy-tale folklore and contemporary pop culture. Whether depicted as evil or good, such a witch remains a mythical being, non-existent in the real world, yet still exerting a significant influence on the perception of women even in modern times. While it seems unlikely that anyone delving into these artistic works would relate them to living women, they can still contribute to the dissemination and reinforcement of existing stereotypes.

Summing up all the above forms of perceiving the term "witch": based on religion, feminism, and pop culture, one can obtain an incredibly multi-layered and complex image of this concept, which can variably impact the perception of contemporary women identifying as witches. Therefore, in the current study, all the aforementioned perspectives have been taken into account to provide the most comprehensive picture of the societal perception of female witches. The approach to the term "witches" in this study is deliberately devoid of enforcing a specific definition or religious association. It embraces a broad spectrum of interpretations, as the intention of this study is to grant its participants the freedom to express their thoughts in an authentic and unrestricted manner, allowing for the free expression of emotions.

This article focuses on the dimension of digital religion, specifically examining users of social media engaging in religious activities within the cyber realm. It aims at expanding knowledge how digital religion as a social and cultural phenomenon broadens understanding of social media communication. Opinions about witches were collected drawing upon a sample of respondents from Poland, a traditionally Catholic country, where Christianity dominated cultural discourse against minorities. As emphasized by Gentry, tensions exist between Christianity and feminism, which is why it is important to underline that the study's sample originates from a country with such conditions. Moreover, in the context of Polish culture, the term "witch" continues to carry negative connotations and is frequently used in a disparaging manner. 10 Collected opinions were subsequently examined using an artificial intelligence tool known as sentiment analysis – a technique utilized to delve into viewpoints, assessments, attitudes, and emotions associated with diverse subjects, topics, and matters. 11 The conducted analysis yielded outcomes that depict the emotions evoked by witches based on Plutchik's model, 12 encompassing eight fundamental emotions. Furthermore, a straightforward sentiment model was employed, wherein each text was evaluated along two dimensions: its positive-negative polarity and overall arousal.<sup>13</sup> Reaching beyond, the scope of analysis was expanded to encompass the incorporation of the San Diego Wisdom Scale (SD-WISE), a psychometric instrument designed to measure wisdom-related cognitive, reflective, and affective qualities in individuals.<sup>14</sup> This instrument assesses wisdom across various

<sup>5</sup> Symonowicz-Jabłońska, "Educational Implications of a Witch Character."

<sup>6</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>7</sup> Anczyk and Malita-Król, "Women of Power."

<sup>8</sup> Ibid.

<sup>9</sup> Gentry, "Feminist Christian."

<sup>10</sup> Anczyk and Malita-Król, "Women of Power."

<sup>11</sup> Liu and Zhang, "A Survey."

<sup>12</sup> Plutchik, "A Psychoevolutionary Theory."

<sup>13</sup> Klimiuk et al., "Vaccine."

<sup>14</sup> Thomas et al., "A New Scale."

domains, including emotional regulation, reflection, empathy, acceptance of diversity, and spirituality. However, it does not explicitly offer a singular definition of wisdom. Therefore, for the purposes of this study, wisdom will be defined as the capacity to make informed judgments and decisions grounded in knowledge, experience, and comprehension. It entails applying acquired knowledge, critical thinking, and sound judgment to effectively navigate intricate situations. Wisdom encompasses a profound understanding of human nature, ethical principles, and the ramifications of actions, guiding actions that are beneficial and ethically sound. As SD-WISE has been used in research across various fields to investigate the role of wisdom-related traits and understanding their impact on individual behavior, this study aims at incorporating it to the attitudes and emotions toward Polish witches. This study is based on an assumption grounded in the analysis of literature that participants who achieve high scores in assessing wisdom-related traits using the SD-WISE scale will be, as expected, more likely to approach the topic of the feminist perception of witches with openmindedness, empathy, and a nuanced understanding, but exhibiting differences depending on gender in the SD-WISE subscales. This premise is grounded on the foundations of Polish society, described as largely patriarchal, Catholic, and negatively inclined toward the stereotype of the feminist witch. 15,16,17 Although wisdom-related traits should indicate thinking that is more free of stereotypes, without negative emotional arousal or the ability to contain the latter, based on current studies, I infer that that differences arising from the specificity of Polish society will be visible in the studied sample.

Individuals who possess wisdom are more likely to approach the topic of witches with open-mindedness, empathy, and a nuanced understanding. Their capacity to critically analyze information, consider various viewpoints, and regulate their emotions enables them to resist succumbing to antiquated stereotypes and biases associated with witchcraft. This cognitive and emotional depth fosters a greater appreciation for the complexities of human nature and societal dynamics, allowing for a more balanced and enlightened perspective on the concept of witches.

The organization of this article is as follows. The subsequent section offers an exploration of the literature concerning the phenomenon of witch stereotypes, encompassing historical and contemporary contexts within the backdrop of feminism, patriarchy, and socially and religiously ingrained misogyny. Drawing upon existing theoretical frameworks, two hypotheses were formulated to guide subsequent research. The third section elaborates on the methodology and data, delineating the methodological approach and detailing the data's origins, the composition of the sample, and the employed research techniques. This is succeeded by the presentation of the research outcomes. Subsequently, the findings are subject to comprehensive discourse, and the final section culminates in a concluding summary of the study.

## 2 Review of the Literature

Research into contemporary witchcraft reveals that the empowerment of women constitutes a pivotal facet within the realm of contemporary Paganism. Notably, these movements often emerge as alluring spiritual pathways, particularly captivating women who seek solace from monotheistic religions and the entrenched societal norms surrounding gender roles. 18 The image of a witch has evolved into a symbol of modern feminist movements and a patroness of feminist endeavors. The stereotype of the malevolent witch has been recognized by feminists as a creation of a patriarchal world, rooted in the fear of women and the subconscious tendency to equate women with evil. The historical persecution of witches has come to represent male oppression and misogyny.<sup>19</sup>

<sup>15</sup> Besta et al., "The Willingness."

<sup>16</sup> Zajkowska, "The Power of Women."

<sup>17</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>18</sup> Besta et al., "The Willingness."

<sup>19</sup> Zajkowska, "The Power of Women."

The witch, a figure historically enshrouded in misogynistic stereotypes, has undergone transformative reinterpretations within feminist perspectives.<sup>20</sup> The image of the Wiccan witch is overwhelmingly positive and closely aligns with these perspectives.<sup>21</sup> Wicca is a contemporary Pagan syncretic religion of witches. Still, the portrayal of a witch remains ambiguous, serving as an emblem of independent womanhood, beholden only to herself, possessing a strong and sought-after personality in today's world. She adeptly navigates societal pressures, resisting the mechanisms that attempt to control women, challenging patriarchal norms. Simultaneously, she remains cast as a demonic and sinister figure, a symbol of malevolence, around which the patriarchal world once held a near-obsessive fixation.<sup>22</sup>

Incorporating a religious perspective into the discourse on the role of gender in shaping opinions about witches is grounded in the assertion made by Świerczek,<sup>23</sup> which contends that religious rights, practices, and doctrines, inherently intended to maintain a neutral worldview, are rooted in a male-oriented thought process, thus bearing a bias toward male perspectives. This assertion is further underscored by Ghanea,<sup>24</sup> who concludes that a significant portion of human rights violations against women is perpetuated in the name of religion, as well as Muldoon and Wilson<sup>25</sup> claiming that Christianity can reinforce positioning women in a subordinate role compared to men also pointing out Christian-motivated harassment against women. The nuanced gender dynamics between the realm of witchcraft and the domain of male-oriented Christianity are a focal point, as noted by Zwissler,<sup>26</sup> who describes the stereotype of the male priest combating the malevolent female witch. Furthermore, Zwissler emphasizes that women are perceived as the spiritually vulnerable link connecting men with Satan. Providing a complementary perspective, Deepwell<sup>27</sup> presented an additional view, indicating that depictions of witches in art created by male artists are marked by misogyny, often casting witches in an unfavorable light as elderly women, hags, or crones – figures characterized as voracious or repugnant. This is especially evident in depictions of their sexuality, frequently intertwined with narratives of Sabbath rituals.

The gender-based bias against witches is elucidated by Mofuoa and Khau,<sup>28</sup> who introduce the notion of "the gendering of witchcraft." Discrimination rooted in gender has endured across global societies for ages, and the historical perception of witchcraft has often unfairly targeted women. This encompassed the identification, public shaming, attribution of blame, and persecution of women deviating from societal norms as witches. Such circumstances are fueled by uneven gender standards that reinforce patriarchal ideologies. The roots of gender-based discrimination against witches intertwine with gender theory, which unveils the intricate ways in which societies exploit apparent biological sex differences to prescribe, justify, and interpret a wide spectrum of hierarchical relationships involving individuals, institutions, and abstract notions. Moreover, it sheds light on the symbiotic relationship between male individual behaviors, societal dynamics, and cultural narratives, influencing the evolution, resistance, and reinforcement of misogyny.<sup>29</sup>

Witchcraft is experiencing a growing following in Poland. In its contemporary manifestation, it goes beyond the preservation of ancient beliefs and instead becomes an inspired amalgamation of selected elements, adapting them to the contemporary context, prevailing social norms, and individual spiritual needs and aspirations, <sup>30</sup> facilitated by the bubbling cauldron of social media platforms. These media disseminate knowledge about witches to a wider audience, particularly showcasing individual practices that inspire and

<sup>20</sup> White, "Double Toil."

<sup>21</sup> Griffin, "The Embodied Goddess."

<sup>22</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>23</sup> Świerczek, "The Dilemmas."

<sup>24</sup> Ghanea, "Navigating the Tensions."

<sup>25</sup> Muldoon and Wilson, "Divine Discrimination."

<sup>26</sup> Zwissler, "In the Study of the Witch."

<sup>27</sup> Deepwell, "Feminist Interpretations."

<sup>28</sup> Mofuoa and Khau, "Rethinking."

<sup>29</sup> McLoughlin, "Medieval Misogyny."

<sup>30</sup> Furman, Wicca i Wiccanie.

highlight the potential for personalization through eclectic approaches in witchcraft, while also giving rise to new mediated practices, offering a fresh perspective on the study of digital religion.<sup>31</sup>

Polish female witches, especially in the realm of digital religion, remain underrepresented in contemporary literature. In the context of feminism, it is worth exploring the works of Anczyk and Malita-Król<sup>32</sup> and Symonowicz-Jabłońska,<sup>33</sup> culturally, references to Szopa,<sup>34</sup> and Kowalewska,<sup>35</sup> are noteworthy. Regarding social media and online communities, Stecko-Żukowska's<sup>36</sup> study investigates the characteristics of Polish witchcraft, tarot practitioners, and the contemporary witch community operating within the realm of TikTok and Instagram.

It is important to emphasize the context in which the term "witch" will be used in this study. In a fairy-talelike perception, she is often depicted as a woman, young or old, beautiful or even repulsive, possessing supernatural abilities such as traveling on brooms, pokers, mortars, or sieves while commanding mastery over the forces of nature.<sup>37</sup> In a folk, indigenous context, a witch is perceived as a herbalist, a healer who possesses knowledge of medicinal plants and lives in harmony with nature. In Wicca, which is becoming more widespread in Poland, a witch embodies a profoundly positive image, closely intertwined with the realms of nature and the supernatural, devoted to the worship of ancient deities.<sup>38</sup> On the other hand, the image of a wicked, malevolent, harmful witch is rooted in Polish Christian stereotypes: selling their souls to the devil, participating in lustful sabbaths, committing murders and cannibalism, casting curses, harming others, and engaging in black magic. Finally, the influence of popular culture, where religious connotations are usually the weakest, should be noted. Proponents of such perceptions of witches should not be disregarded in research, as Abidin<sup>39</sup> argues that disregarding "frivolous" users as unworthy of scholarly attention may overshadow valuable discoveries.

The male perception of women as susceptible to magic implied beliefs about their supposed moral and intellectual frailty, a nature prone to wickedness, associating them with evil and inferiority. Conversely, men holding such views were labelled as chauvinists, misogynists, and proponents of patriarchy.<sup>40</sup> In contrast to these discriminatory beliefs, the contemporary image of a witch stands as a feminist who contends that genuine freedom for both women and men remains unattainable until the prevailing unequal power dynamics between genders are dismantled. 41 While some core stereotypes of the witch stand out: the perilous and malicious woman in Christian culture, the feminist interpretation of a liberated, self-reliant woman living on the fringes of patriarchal norms, and Wiccan nature witch – the latter two largely share similarities. 42

Within the context of witchcraft, wisdom acquired through life experiences is intertwined in one's worldview and way of living, often being perceived as an attribute of a witch. 43,44,45 That formed the foundation for the incorporation of the SD-WISE scale into the study. The essence of wisdom embodies a holistic and intricate personality attribute, comprised of the six most frequently encompassed elements: social advising, emotional regulation, pro-social behaviors, insight, tolerance for divergent values, and decisiveness. The social advising aspect pertains to the capability of providing astute counsel to others, drawing from a foundation of comprehensive life wisdom and competencies. The emotional regulation facet examines one's perceptiveness in

<sup>31</sup> Stecko-Żukowska, "Zrobiliśmy rewolucję."

<sup>32</sup> Anczyk and Malita-Król, "Women of Power."

<sup>33</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>34</sup> Szopa, "Enchanted Imagination."

<sup>35</sup> Kowalewska, "Czarownica."

<sup>36</sup> Stecko-Żukowska, "Zrobiliśmy rewolucję."

<sup>37</sup> Johns, Baba Yaga.

<sup>38</sup> Anczyk and Malita-Król, "Women of Power."

<sup>39</sup> Abidin, "Aren't These Just."

<sup>40</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>41</sup> Starhawk and Valentine, The Twelve Wild Swans.

<sup>42</sup> Anczyk and Malita-Król, "Women of Power."

<sup>43</sup> Buckland, Buckland's Complete Book.

<sup>44</sup> Geest, "From Wisdom to Witchcraft."

<sup>45</sup> Howard, Modern Wicca.

effectively navigating adverse emotions and emotional stressors that can impede sound decision-making, while fostering a preference for affirmative sentiments through adept emotional control and regulation. The pro-social behaviors element evaluates one's proficiency in nurturing positive interpersonal bonds, along-side the exhibition of compassion and conscientious conduct, encompassing attributes such as empathy, compassion, altruism, and a sense of equity. Insight quantifies the aptitude and yearning to fathom one's innermost self and actions at profound levels. The aspect of tolerance for divergent values alludes to value relativism, denoting an attitude of non-judgment, acceptance, and an inclination to explore alternative perspectives. This dimension gauges receptivity and ease in embracing values and viewpoints that may differ from one's own. Lastly, the decisiveness component evaluates the capacity to make judicious decisions promptly, while concurrently assessing one's ease and confidence in the decision-making process. 46,47,48 The aforementioned attributes of wisdom correspond with the contemporary feminist perception of witches.

The practice of sentiment analysis entails the automated task of deducing the writer's disposition, emotional state, or any other affective facet from a provided text.<sup>49</sup> As a result, it furnishes researchers with the capacity to glean nuanced insights into discussions, concurrences, and divergences, thus facilitating a thorough comprehension. Sentiment analysis aims to ascertain the positive or negative sentiment conveyed within a text, while also facilitating the extraction of underlying emotions. These inquiries bear substantial import within the domains of social sciences, and despite the rapid evolution of various sentiment investigations within this realm in recent years,<sup>50</sup> their application in the context of gender and witchcraft remains relatively uncharted. To the author's best knowledge at the time of crafting this manuscript, no publication has distinctly addressed the application of sentiment analysis to gauge perspectives concerning witches.

This article responds to the calls made by Symonowicz-Jabłońska, <sup>51</sup> highlighting the need for research into the witch stereotype, Zwissler, <sup>52</sup> who underscores the need for conducting more inclusive scholarship that takes into account alternative witchcraft narratives, especially feminist ones. The impetus for undertaking the study was also derived from the work of Symonowicz-Jabłońska, <sup>53</sup> who conducted an investigation into children's knowledge regarding the concept of witches through an analysis of their associations, thereby advocating for further exploration into the perception of witches. Finally, Dehm and Millbank <sup>54</sup> further underscored the significance of research on contemporary witches, pointing out that instances of witch-craft-related violence have evolved into a subject of concern for international human rights organizations and advocates. By examining the sentiments surrounding witches, this work aims to delve into the concept of a witch and its evolution from a sociohistorical viewpoint, where this term has been historically associated with female wrongdoing, <sup>55</sup> progressing toward affirmative and feminist interpretations of a wise and liberated woman. As the final point, the study addresses the invitation presented by Thomas and colleagues, <sup>56</sup> highlighting the necessity for further research regarding the assessment of the reliability and validity of SD-WISE, which should be assessed across various socio-cultural, racial, ethnic, and national samples. Therefore, two following hypotheses are proposed:

H1: The male gender is associated with an increased likelihood of experiencing negative emotions, as outlined in the Plutchik model, including anger, fear, sadness, and disgust toward female witches.

H2: The female gender is associated with an increased probability of possessing a higher level of wisdom typical of witch-related connotations: insight, tolerance, and prosocial skills.

<sup>46</sup> Jeste et al., "Is Spirituality."

<sup>47</sup> Thomas et al., "A New Scale."

<sup>48</sup> Thomas et al., "Abbreviated."

<sup>49</sup> Mohammad, "Sentiment Analysis."

<sup>50</sup> van der Veen and Bleich, "Atheism."

<sup>51</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>52</sup> Zwissler, "In the Study of the Witch."

<sup>53</sup> Symonowicz-Jabłońska, "Educational Implications of a Witch Character."

<sup>54</sup> Dehm and Millbank, "Witchcraft Accusations."

<sup>55</sup> Martin, Conjuring Moments.

<sup>56</sup> Thomas et al., "A New Scale."

#### 3 Data and Methods

#### 3.1 Participants, Measures, and Data Collection

A total of 724 volunteers stepped forward to partake in this investigation and successfully completed a survey. The data collection transpired during the second quarter of 2022. The participants were primarily enlisted through social media platforms and via snowball sampling techniques. All eligible adults residing in Poland (ranging in age from 18 to 73 years; female M = 28.15, SD = 10.99, male M = 26.55, SD = 10.43) were invited to engage in a survey focused on their attitudes and sentiments toward witches, employing the SD-WISE scale employing a 5-point Likert scale. The internal consistency reliability assessments for the facets of the SD-WISE scale exhibited a spectrum between 0.76 and 0.83. The Cronbach's a coefficients were determined as follows: 0.79 for emotional regulation, 0.76 for pro-social behaviors, 0.81 for insight, 0.83 for tolerance toward divergent values, 0.76 for decisiveness, and 0.81 for social advising. The participants also disclosed their gender, and for the purpose of validating the sample assumptions, they additionally provided their country of residence and age, given that the study was specifically aimed at adult individuals of Polish nationality. The protocols and materials employed in the research received the ethical approval of the blinded for the review purposes. Prior informed consent was obtained from all participants, who were informed of the voluntary nature of their participation and their freedom to withdraw at any point. No incentives were offered to the participants. The study encompassed 539 female participants and 185 male participants for the purpose of comparative analysis.

## 3.2 Data Analysis

All statistical computations were executed using the software application Statistica 13.3.0 (Tibco Software Inc., Palo Alto, CA, USA). Following preliminary data exploration, eight records were excluded due to inconclusive validation questions, resulting in a final sample size of N = 724. For group comparisons, the Mann–Whitney Utest with continuity correction was employed. It is a nonparametric statistical test used to compare two independent groups when the data are measured on an ordinal or continuous scale. The continuity correction is applied to adjust for the discreteness of the data and to improve the accuracy of the test when sample sizes are unequal. The main aim of using the Mann-Whitney U test with continuity correction is to determine whether there is a statistically significant difference between the two groups. All analyses were performed at a significance threshold of p < 0.050. The free-response question concerning sentiments and perceptions toward witches underwent sentiment analysis. The remarks collected during this investigation were subjected to analysis utilizing Sentimenti software tools for text sentiment analysis (developed by W3A.PL). The input dataset consisted of 724 natural language comments, with each one stored on a separate line in the database. The Sentimenti toolkit encompasses two complementary frameworks: Plutchik's model of eight primary emotions and a straightforward sentiment model with positive-negative polarity and overall arousal. Plutchik's model,<sup>57</sup> introduced by psychologist Robert Plutchik, is a comprehensive theory that categorizes human emotions into eight primary states, universally recognized across cultures: joy, sadness, anger, fear, surprise, disgust, trust, and anticipation. This model provides a framework for studying and understanding the complexities of human emotions. A sentiment model is a computational algorithm designed to analyze and classify text data based on the underlying sentiment expressed within the text, categorizing it as positive, negative, or neutral. Positive-negative polarity refers to the distinction between positive and negative sentiments expressed in text data. It indicates whether the sentiment conveyed is favorable or unfavorable. Overall arousal refers to the general level of emotional activation or intensity expressed in text data. It measures the degree to which the language used evokes strong emotional responses, whether positive or negative. Sentiment analysis offers researchers valuable insights into subjective perceptions, attitudes, and emotions

expressed in open-ended responses. Automating the categorization of sentiments as positive, negative, or neutral streamlines data processing and reveals recurring themes or emerging topics. This quantitative approach complements qualitative analysis, enhancing the credibility of findings. Additionally, sentiment analysis enables the measurement and comparison of attitudes across different groups or time periods, supporting evidence-based decision-making and real-time monitoring of public opinion. Overall, it provides efficient and objective tools for understanding societal attitudes and reactions, including those toward topics like witchcraft. In this study, via automated assessment, each text is evaluated across 11 variables, encompassing arousal, positive, and negative sentiment, as well as emotions: anger, fear, sadness, disgust, surprise, acceptance, hope, and joy.

#### 4 Results

The exploratory open-ended inquiry regarding the perspectives and sentiments of the participants toward witches refrained from enforcing a specific definition or religious association. It embraced a broad spectrum of interpretations, spanning from witches in folklore and tales to historical witch hunts, contemporary portrayals in popular culture, and real-world manifestations. The intention was to grant respondents the freedom to express their thoughts candidly and authentically. Every entry subjected to sentiment analysis received a proportional rating denoting the contribution of the eight primary emotions as per Plutchik's model, alongside polarization (indicating opposing positive or negative emotions) and arousal. Polarization signifies the potential for robustly positive or negative reactions, graded on a continuum from balanced responses to vividly contrasting emotions. Arousal gauges the level of stimulation, be it positive, negative, or neutral, reflecting the degree of emotional excitement evoked by the content. Its scale ranges from subdued to intense arousal, illuminating the potency and fervor of the opinion's emotional impact. The outcomes of the executed sentiment analysis are presented in Table 1.

Table 1 displays the average values and standard deviations pertaining to both gender-based analyzed groups. Following this, an elaboration on the outcomes of the Mann–Whitney U test (employing continuity correction) was conducted to investigate the potential significant difference between the two distinct groups. In the examined sample, women exhibited higher levels of expectation, trust, and joy, while men displayed higher manifestations of negative emotions: anger, sadness, and disgust. Fear and surprise did not significantly

Table 1: Se	ntiment analysis	results for	emotions toward	witches among	the sample
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	Female <i>N</i> = 539		Male N = 185		Z	р	
	М	SD	М	SD			
Anger	0.199	0.123	0.247	0.145	-4.122	0.000	***
Fear	0.153	0.111	0.153	0.131	-0.437	0.662	
Expectation	0.353	0.135	0.309	0.139	4.126	0.000	***
Surprise	0.338	0.130	0.318	0.140	1.624	0.104	
Trust	0.387	0.182	0.341	0.201	3.665	0.000	***
Sadness	0.204	0.138	0.231	0.161	-2.204	0.028	*
Disgust	0.164	0.091	0.195	0.112	-3.685	0.000	***
Joy	0.403	0.198	0.357	0.211	3.146	0.002	**
Positive	0.427	0.208	0.383	0.229	2.672	0.008	**
Negative	0.130	0.134	0.180	0.164	-3.437	0.001	***
Stimulation	0.503	0.123	0.475	0.131	2.948	0.003	**

Z = Mann-Whitney U test (with continuity correction). p Values <0.05\*, <0.01\*\*\*, < 0.001\*\*\*. M = Mean, SD = standard deviation. The bold font indicates higher values in positions that statistically differentiate groups significantly (p < 0.05).

differentiate between the two groups. Additionally, women demonstrated a stronger positive polarization, while men showed a negative one, albeit less pronounced. Stimulation also proved to significantly differentiate both groups, favoring women. Taking into account the obtained outcomes for the study's participants, the first hypothesis, suggesting that the male gender is linked to a heightened probability of experiencing negative emotions, as delineated in the Plutchik model, encompassing anger, fear, sadness, and disgust toward female witches, receives substantial support for three of the mentioned emotions. However, it does not find confirmation in the studied group concerning fear.

Results of the distinctions between the sampled groups in terms of SD-WISE (Table 2) indicate differences for each subscale. Women participants exhibited higher levels of social advising, insight, pro-social behaviors, and tolerance for divergent values, whereas male ones demonstrated greater decisiveness and emotional regulation.

The above results indicate partial confirmation of the second hypothesis in the studied sample that the female gender is associated with an increased probability of possessing a higher level of wisdom typical of witch-related connotations: insight, tolerance, and prosocial skills.

# 5 Discussion

In this research, the attitude toward witches was examined based on gender differences within the realm of digital religion. For this purpose, sentiment analysis was employed, which is a technique used to analyze text data and ascertain the sentiment, emotional tone, or subjective attitude expressed within the text. Additionally, an SD-WISE was introduced, closely associated with the themes of witchcraft and witches. The obtained results affirmed the presence of differences in experienced emotions toward witches, with a more positive orientation observed among studied women and a negative one among men. Moreover, female participants exhibited higher levels of wisdom in categories closely related to pro-social behaviors akin to spirituality and empathy, while male ones displayed greater emotional regulation and decisiveness. Hence, the outcomes suggest that attitudes toward witches, often seen not only as constructs of religious oppression by Christianity or products of popular culture but also as a facet of the feminist movement, are influenced by gender dynamics.

In light of the aforementioned findings, the assumption on the studied sample that gender influences the emotional attitudes toward witches, aligning with more positive sentiments among women and more negative sentiments among men, can be considered confirmed. Regarding the adopted hypotheses, the first one that the male gender increases the likelihood of experiencing negative emotions toward witches appears to be confirmed for anger, sadness, and disgust among the studied group. In the context of the examined sample, the

Table 2: Distinctions	in SD-WISF	scale results	among the sample

	Female		Male		Z	р	
	N =	539	<i>N</i> = 185				
	М	SD	М	SD			
SD_WISE	3.667	0.482	3.579	0.513	2.023	0.043	*
Social advising	3.807	0.606	3.534	0.757	4.235	0.000	***
Decisiveness	3.128	0.956	3.291	0.867	-1.997	0.046	*
Emotional regulation	2.894	0.842	3.141	0.800	-3.587	0.000	***
Insight	4.060	0.751	3.905	0.785	2.334	0.020	*
Pro-social behaviors	3.992	0.685	3.808	0.726	2.860	0.004	**
Tolerance for divergent values	4.123	0.753	3.796	0.858	4.711	0.000	***

Z = Mann–Whitney U-test (with continuity correction). p Values <0.05\*, <0.01\*\*, <0.001\*\*\*. M = mean, SD = standard deviation. The bold font indicates higher values in positions that statistically differentiate groups significantly (p < 0.05).

second hypothesis, stating that the female gender is associated with an increased likelihood of possessing a higher level of wisdom typical of witch-related connotations: insight, tolerance, and prosocial skills, also appears to be confirmed.

The outcomes of sentiment analysis on attitudes toward witches revealed a general prevalence of stronger positive emotions among women, particularly in terms of levels of expectation, trust, and joy. In contrast, men exhibited greater expressions of anger, sadness, and disgust, along with an overall inclination toward negative polarization. Notably, fear and surprise exhibited no statistically significant differentiation between the two groups. These results seem to resonate with the underlying concepts explored in studies addressing feminist and patriarchal influences on witchcraft, as cited in the present study. 58,59,60,61,62

The outcomes within the scope of the SD-WISE scale, revealing elevated levels of social advising, insight, pro-social behaviors, and tolerance for divergent values among women, align with the contemporary and emerging archetype of the witch as a wise, conscious, and liberated woman living in harmony with her surroundings. These subdimensions of wisdom are intricately connected with the concept of spirituality, signifying a profound sense of belonging to a greater whole or engaging with the universe. This alignment resonates not only with the tenets of modern witchcraft but also strongly with women. As asserted by Lauver, 63 the expansion of feminist movements has fostered the evolution of contemporary women's spirituality, which in turn upholds the intrinsic connections among all forms of life. Furthermore, these findings are consistent with research indicating a heightened pro-social inclination among females. 64 Studied women tend to report both offering and receiving more significant social support compared to men, 65 and they exhibit a higher degree of empathy than their male counterparts. 66

The association of decisiveness with the male gender aligns with the findings of Shapiro, Ingols, and Blake-Beard, here this attribute is frequently utilized to characterize masculinity, and Buddeberg-Fischer and others, hwose study also revealed that men exhibited higher levels of this trait compared to women. Diversity concerning emotional regulation, on the other hand, finds corroboration in the study by Mink and colleagues, revealing that men derive greater advantage from emotional suppression than from emotional expression, and in the research of Thayer and colleagues, who demonstrated that women exhibit heightened emotional sensitivity compared to men, along with a higher propensity to acknowledge and articulate their emotional experiences.

It needs to be acknowledged that the article has some important limitations, mainly due to the choice of sample used in research. To begin with, the sample comprised individuals from Poland due to its conservative cultural and religious influences, which might restrict the extent of generalizability, It is important to exercise caution when extrapolating the outcomes to broader populations, and further validation of the study across diverse settings is encouraged. Furthermore, the study adopted a cross-sectional approach, and all data were self-reported, raising inquiries about the precision of the responses. It is also important to consider the limitations stemming from the application of the snowball sampling technique, which could potentially influence the results of a study by introducing biases in the sample selection process. This sampling method relies on existing participants to refer or recruit additional participants, which may lead to the overrepresentation of certain groups or characteristics within the sample. Consequently, the sample may not be fully

<sup>58</sup> Anczyk and Malita-Król, "Women of Power."

<sup>59</sup> Besta et al., "The Willingness."

<sup>60</sup> Mofuoa and Khau, "Rethinking."

<sup>61</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>62</sup> Świerczek, "The Dilemmas."

<sup>63</sup> Lauver, "Commonalities."

<sup>64</sup> Gašić-Pavišić and Janjetović, "Connection."

<sup>65</sup> Fuhrer et al., "Gender."

<sup>66</sup> Peng et al., "Attachment."

<sup>67</sup> Shapiro et al., "Using Power."

<sup>68</sup> Buddeberg-Fischer et al., "The Influence."

<sup>69</sup> Mink et al., "Gender Differences."

<sup>70</sup> Thayer et al., "Gender Differences."

representative of the population under study, affecting the generalizability of the findings. Additionally, snowball sampling may inadvertently amplify existing social networks or connections, leading to the clustering of similar perspectives or characteristics within the sample, thereby limiting the diversity of viewpoints. Therefore, researchers should exercise caution when interpreting results obtained from this study, recognizing that these findings are not generalizable to the entire Polish population. Lastly, referring to the disparity between the numbers of male and female participants, steps to mitigate the risk by employing the Mann–Whitney U test with continuity correction for data analysis have been taken. This test can help mitigate the impact of unequal group sizes, a scenario that may introduce inaccuracies in traditional parametric tests. The Mann-Whitney U test is nonparametric; thus, it doesn't rely on assumptions about data distribution, offering greater flexibility when dealing with differences in sample sizes. However, it is important to note that these unequal group sizes still pose a limitation to the study. Despite these limitations, the findings may lay the groundwork for future inquiries into research on gender-associated stereotypes of witches.

Interpreting the results, one must take into consideration the fact that Poland is a country strongly influenced by Catholicism. However, it is worth noting that not only have Christian religions contributed to the negative portrayal of witches, but they also view feminism as incompatible with their values.<sup>71</sup> Numerous studies have deduced that religious identity often harbors anti-feminist sentiments, associating it with notions of self-centered individualism, distorted theology, erosion of traditional gender roles, rising divorce rates, promiscuity, unconventional sexual orientations, abortion, resistance to Christian cultural norms, and progressive political ideologies.<sup>72</sup> A thorough examination of the correlation between the practice of Catholic faith among men and their attitudes toward witches would constitute a valuable avenue for future research.

When examining contemporary female witchcraft, it is crucial to also acknowledge the significant influence of social media and digital religion. This influence has led to an increasing presence of religious groups and their members in the virtual realm, facilitating the dissemination of religious content and reshaping religious identities.<sup>73</sup> Social media can thus be a factor influencing the shaping of opinions regarding contemporary witches. This is also an area worthy of further in-depth research.

The obtained results indicate a favorable reception of the witch figure among women, aligning with the assertion of Anczyk and Malita-Król<sup>74</sup> that witches can serve as symbolic sources of inspiration for contemporary Polish feminists. Drawing from the witch stereotype prevalent in modern Polish popular culture, rooted in magical powers and the female gender, women can discover the strength within it for self-development and the cultivation of sisterhood, potentially leading to the emergence of a novel, affirmative archetype.

## 6 Conclusions

The conducted study focused on the dimension of digital religion, by studying attitudes of social media users engaging in religious activities in a digital world. The present study explored the stereotype of witches, ranging from the malevolent Christian witch rooted in chauvinistic and misogynistic notions to contemporary feminist concepts grounded in women's freedom and equality. Disparities in the emotions evoked by witches among men and women were observed. Hence, this investigation addressed the call made by various scholars, 75,76,77,78,79 highlighting the limited acknowledgment of research concerning witch stereotypes. The

<sup>71</sup> Gallagher, "The Marginalization."

<sup>72</sup> Hobbs, "Characterizations of Feminism."

<sup>73</sup> Miller, "How Modern Witches."

<sup>74</sup> Anczyk and Malita-Król, "Women of Power."

<sup>75</sup> Dehm and Millbank, "Witchcraft Accusations."

<sup>76</sup> Martin, Conjuring Moments.

<sup>77</sup> Symonowicz-Jabłońska, "Educational Implications of a Witch Character."

<sup>78</sup> Symonowicz-Jabłońska, "The Figure of a Witch."

<sup>79</sup> Zwissler, "In the Study of the Witch."

obtained results also provide new insights into the implementation of the SD-WISE scale in sociological research.

The aim of this study was to broaden the knowledge of how digital religion within the realm of social and cultural occurrences, expands the understanding of social media communication. The implications of these findings could be of significance to sociologists and other researchers engaged in contemporary gender studies, as well as the domains of religion, culture, and witchcraft showing that modern witch perceptions may have gender differences.

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